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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,909	10/30/2003	Jongmo Sung	51876P397	9718

8791 7590 04/14/2009

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EXAMINER	
KOVACEK, DAVID M	

ART UNIT	PAPER NUMBER
2626	

MAIL DATE	DELIVERY MODE
04/14/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/697,909	SUNG ET AL.	
	Examiner	Art Unit	
	David Kovacek	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is response to applicant's Amendment, filed 12/18/2008, in which the applicant amends **claims 1**, **6**, and **8-9** and provides arguments for patentability of the claims over the previously cited prior art.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/18/2008 has been entered.

Response to Amendment

3. The applicant's amendments to **claims 1**, **6** and **8-9** have been considered and are accepted. It is noted by the examiner that the current amendments substantially change the scope of the limitations of the claims as previously presented. It is noted by

the examiner that formal acceptance of the conditions of the claims is not an indication of allowability of the claims over the prior art. Appropriate rejections are included in this Office Action in the relevant sections below.

Response to Arguments

4. Applicant's arguments filed 12/18/2008 have been fully considered but they are not persuasive.

The applicant first argues that the prior art, specifically Dejaco (US Patent 6,620,990; cited previously), in view of Cho (US Patent 6,208,958; cited previously), and in further view of Arslan (US Patent 6,615,174; cited previously) "does note teach or suggest that bandwidth conversion is performed on both formant parameters and excitation signals *[emphasis in original]* (Remarks of 12/18/2008: Page 09, paragraph 04)."

However, the applicant does not provide any further evidence, reasoning, or rationale to further support this argument. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Furthermore, the examiner maintains that the disclosure of Dejaco are relevant to the limitation in question (Col. 2, lines 49-53), in particular the disclosure of an

"excitation parameter translator" (Fig. 6, element 630; Column 7, lines 04-08) that is capable of translating input excitation parameters from an input CELP format to an output CELP format. As noted in the Remarks of 12/18/2009 by the applicant, both Cho (Fig. 2, element 210; Col. 1, line 61 - Col. 2, line 05; Col. 2, lines 63-65) and Arslan (Col. 9, lines 01-03; Claim 1) disclose the condition of transcoding between formats of differing bandwidths. The appropriate analysis for the reasons such a combination of the prior art would have been obvious to one of ordinary skill in the art are included below in the appropriate sections of this Office Action.

In response to applicant's argument that Cho is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, all references have been considered to illustrate concepts related to the field of speech data analysis including for usage in encoding speech. No direct argument, evidence or reasoning has been provided by the applicant to refute this assertion. Therefore, the examiner contends that this assertion by the applicant is merely an allegation of the conditions of the prior art without any further support, and is therefore non-persuasive.

The applicant next argues that the teachings of Arslan are sufficient to accommodate the limitations to which they are applied to for **claim 1**, because:

> "Arslan discloses a technique for formant bandwidth compression/extension (Fig. 5). The technique compresses or extends a width of each formant component...within a specific frame of a signal. By contrast, Claim 1 recites compression or extension of bandwidth of entire signals, e.g., extension from 0-4 KHz to 0-8 KHz bandwidth, or compression from 0-8 KHz to 0-4 KHz bandwidth (Remarks of 12/18/2009: Page 10, paragraph 01)"

The examiner contends that this argument seems to be directed to an interpretation of the limitations of **claim 1** that is narrower than what the examiner has contended in the broadest reasonable interpretation to one of ordinary skill in the art. Specifically, the limitation in question, as recited in **claim 1**, merely requires `the formant bandwidth converting means compresses the bandwidth of the formant parameters and generates the bandwidth-corrected formant parameters when the bandwidth of the input CELP format is wider than that of the output CELP format,` and additionally that `the formant bandwidth converting means expands the bandwidth of the formant parameters and generates the bandwidth-corrected formant parameters when the bandwidth of the input CELP format is narrower than that of the output CELP format.`

The examiner contends that the broadest reasonable interpretation of the limitations of **claim 1** would include the disclosures of both Cho and Arslan as applied in the previous rejection. Specifically, the limitations of **claim 1** are silent with respect to operation upon the *totality* of the input signal's respective parameters, and merely require operation upon the formant parameters. Arslan's particular implementation with respect to each frame of the input signal is therefore applicable to the limitations of **claim 1**. The applicant is reminded that it is improper to interpret the claims strictly within the context of the specification, and that the broadest reasonable interpretation to one of ordinary skill in the art should be considered as the full scope of the claim language.

The applicant next argues with respect to Kao (US Patent 5,371,853), asserting that "there is nothing Kao that indicates that the perceptual weighting filter receives an excitation signal having a converted bandwidth (Remarks of 12/18/2009: Page 10, paragraph 02)."

The examiner asserts that such teachings are in fact present in the disclosure of Kao, in particular the disclosure of the passing of short term speech information to a perceptual weighting filter (Fig. 4, elements 64, 69; Fig. 5; Col. 6, lines 09-22), wherein the short term speech information corresponds to the excitation signals.

5. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

It is noted by the examiner that the applicant has not provided any evidence, support, or reasoning that the previous rejection of **claim 1** under 35 USC 103(a) has been made improperly with regard to what would be considered obvious to one of ordinary skill in the art at the time the invention was made.

For at least the above reasons, the applicant's arguments are considered non-persuasive.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. **Claims 1-2**, and **4-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dejaco in view of Cho, in further view of Arslan, and in further view of Koa.

Regarding **claim 1**, Dejaco discloses an apparatus for trans-coding between CELP type codecs having different bandwidths, comprising:

- a first type converting means for receiving formant parameters from the input bit stream and converting formant parameters from the type specified in the input CELP format to a suitable type for a formant bandwidth conversion (Fig. 6, item 610A; Fig. 7, item 702; Col. 7, lines 11-14);
- a formant parameter translating means for translating formant parameters from input CELP format to output CELP format and generating translated formant parameters in an output CELP format (Fig. 5, item 502; Fig. 7, item 702; Col. 2, lines 45-49; Col. 7, lines 16-19);
- a formant parameter quantizing means for receiving the translated formant parameters and quantizing the translated formant parameters (Fig. 5, item 506; Fig. 7, item 712; Col. 2, lines 45-49; Col. 6, lines 55-57; Col. 7, lines 16-19);
- an excitation parameter translating means for translating excitation parameters from input CELP

format to output CELP format and generating excitation parameters in an output CELP format (Fig. 6, item 630; Col. 2, lines 49-53; Col. 6, lines 04-08); and

- an excitation quantizing means for receiving the translated excitation parameters and quantizing the translated excitation parameters (Fig. 5, item 506; Col. 6, lines 60-62).

Dejaco further renders obvious the limitation of the excitation parameter translating means to receive the frame rate-corrected formant parameters from the formant frame rate converting means before the translated formant parameters are quantized by the formant parameter quantizing means. The order of the operations for the translation and quantization is not known to be a relevant factor in the direct results of the teachings of Dejaco. The examiner contends that therefore one of ordinary skill in the art could rearrange the order of operations to obtain predictable results. One of ordinary skill would have the motivation to attempt to rearrange the order of the operations for the purpose of determining a configuration of the invention which results in an optimal processing speed. Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art to implement the teachings of Dejaco in an alternate order of operations in order to realize the optimal processing implementation.

Dejaco additionally discloses an excitation parameter translator that includes an excitation synthesizing means (Fig. 6, item 606; Col. 8, lines 25-31) and a codebook searcher (Fig. 6, item 608; Col. 7, lines 07-08; Col. 8, lines 32-34).

Dejaco does not adequately disclose that the formant parameter translating means includes a formant bandwidth converting means.

Cho discloses a pitch determination apparatus that includes a formant bandwidth conversion [extension] unit (Fig. 2, element 210; Col. 1, line 61 – Col. 2, line 05; Col. 2, lines 63-65) for the purposes of extending formant bandwidth.

Dejaco in view of Cho does not adequately disclose the bandwidth converting means for compressing formant bandwidth.

Arslan discloses formant bandwidth compression [reduction] by direct adjustment of line spectral frequencies (Col. 9, lines 01-03) for the use in transcoding ("transforming a source signal into a target signal"; Claim 1).

Kao further discloses interpolation of parameters to construct a corresponding perceptual weighing filter [generating impulse responses for perceptual weighting filter based on correlated input speech data] (Col. 6, lines 10-15, lines 32-37). Kao additionally discloses that said perceptual weighting filter is fed input comprising excitation parameters [short term speech information] (Fig. 4, elements 65, 69; Fig. 5; Col. 6, lines 09-22).

Kao further renders obvious the limitation of `the excitation signal having the bandwidth of the output CELP format` because it would be known to one of ordinary skill in the art that in any transcoding system, any intermediate

step within said system would likely operate upon data formatted using either the bandwidth of the input or the output signal. Furthermore, the examiner contends that it would have been known to one of ordinary skill in the art how to implement an intermediary step using either an input or output bandwidth with predictable successful results. Because there are a finite number of options with regard to the implementation of the system with predictable successful results, it would have been obvious to one of ordinary skill in the art to attempt either implementation because a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp.

These references are combinable because each is directed to a method of speech data analysis and also to encoding speech. Further, Cho provides motivation to combine in disclosing the utility of formant bandwidth extension in reducing the influence of a first formant, thus yielding a more accurate analysis (Col. 1, line 62).

Arslan further provides motivation in disclosing the usefulness of compression of formant bandwidth to remove audible buzz artifacts caused by overly-expanded formant bandwidths (Col. 8, lines 58-61).

Koa provides further motivation in disclosing the need for reduced complexity of processing the excitation parameters of a CELP-type codec (Col. 3, lines 42-45).

Therefore, the examiner contends that it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Dejaco in view of Cho to implement an apparatus for trans-coding between CELP type codecs including a formant bandwidth conversion device used for reducing the influence of a

first formant in speech data, and to further use the teachings of Arslan to remove audible buzz artifacts caused by overly-expanded formant bandwidths, and to further still use the teachings of Koa to reduce the complexity of processing the excitation parameters of a CELP-type codec.

Regarding **claim 2**, Dejaco in view of Cho, in further view of Arslan and in further view of Kao discloses all limitations of **claim 1** as applied above and Dejaco further discloses:

- a formant model order converting means for receiving the input formant parameters from the second type converting means and converting the formant parameters from the model order in the input CELP format into the model order in the output CELP format (Fig. 7, item 704; Fig. 6, item 602);
- a third type converting means for receiving the order-corrected formant parameters from the formant model order converting means and converting the formant parameters from the type used in the model order converting means to a suitable type for frame rate conversion (Fig. 6; item 610B);
- the formant frame rate converting means for receiving the input formant parameters from the third type

converting means and converting the formant parameters from the frame rate in the input CELP format to the frame rate in the output CELP format (Fig. 7, item 708); and

- a fourth type converting means for receiving the frame rate-corrected formant parameters from the formant frame rate converting means and converting the formant parameters from the type used in the formant frame rate converting means to a suitable type for the formant parameter quantizing means in the output CELP format (Fig. 6, item 610C).

Though Dejaco in view of Cho, in further view of Arslan and in further view of Kao does not explicitly disclose a second type converting means for bandwidth-conversion, this limitation is inherently required of any system that permits transcoding between codecs of different bandwidths, such as the system disclosed by the teachings of Dejaco in view of Cho, and in further view of Arslan.

Regarding **claim 4,** Dejaco in view of Cho, in further view of Arslan and in further view of Kao discloses all limitations of **claim 2** as applied above, and Dejaco further discloses the use of truncation and extension for model order correction (Col. 7, lines 30-41).

Regarding **claim 5**, Dejaco in view of Cho, in further view of Arslan and in further view of Kao discloses all limitations of **claim 2** as applied above, and Dejaco further discloses the use of interpolation and decimation for adjusting frame rates (Col. 7, line 63 – Col. 8, line 08).

Regarding **claim 6**, Dejaco in view of Cho, and in further view of Arslan discloses all limitations of **claim 2** as applied above, and Cho discloses a pitch determination apparatus that includes a formant bandwidth conversion [extension] unit (Fig. 2, element 210; Col. 1, line 61 – Col. 2, line 05; Col. 2, lines 63-65) for the purposes of extending formant bandwidth.

Arslan discloses bandwidth compression as applied above, but does not adequately disclose bandwidth expansion.

Dejaco in view of Cho and in further view of Arslan does not adequately disclose a separation of adaptive and fixed codebooks, a perceptual weighting filter before the codebook searching means.

Koa discloses a CELP vocoder that includes both an adaptive and fixed codebook (Fig. 4; Col. 5, lines 42-59), and also perceptual weighting filters before codebook searching (Fig. 4, items 66-68; Col. 5, line 69 – Col. 6, line 09).

These references are combinable because each is directed to a method of speech data analysis and also to encoding speech. Further, Cho provides motivation to combine in disclosing the utility of formant bandwidth extension in reducing the influence of a first formant, thus yielding a more accurate analysis (Col. 1, line 62).

Arslan further provides motivation in disclosing the usefulness of compression of formant bandwidth to remove audible buzz artifacts caused by overly-expanded formant bandwidths (Col. 8, lines 58-61).

Koa provides further motivation in disclosing the need for reduced complexity of processing the excitation parameters of a CELP-type codec (Col. 3, lines 42-45).

Therefore, the examiner contends that it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Dejaco in view of Cho to implement an apparatus for trans-coding between CELP type codecs including a formant bandwidth conversion device used for reducing the influence of a first formant in speech data, and to further use the teachings of Arslan to remove audible buzz artifacts caused by overly-expanded formant bandwidths, and to further still use the teachings of Koa to reduce the complexity of processing the excitation parameters of a CELP-type codec.

Regarding **claim 7**, Dejaco in view of Cho, in further view of Arslan and in further view of Koa teaches all limitations of **claim 6** as applied above, and Arslan discloses the reduction of formant bandwidth by direct adjustment of line spectral frequencies, including a decimation method (use of "bandwidth adjustment ratio"; Col. 9, lines 06-15). Because the decimation is achieved using a bandwidth adjustment ratio, it would be obvious to adjust the ratio to achieve an interpolation [expansion] of formant bandwidth. Further, Arslan specifically discloses that excitation parameters can be transformed in the same manner as formant parameters (Col. 10, lines 18-21).

This limitation is directly related to the teachings of Arslan as applied above to **claim 6**, and therefore the motivation to combine the references is the same for **claim 7** as applied above to **claim 6**.

Regarding **claim 8**, this claim is very similar to **claim 1**, and is rejected for the same reasons.

Claim 1 corresponds to **claim 8** since they are related as the apparatus and method of using the apparatus, and hence are rejected for the same reasons as given above.

Regarding **claim 9**, this claim is very similar to **claim 1**, and is rejected for the same reasons.

Claim 1 corresponds to **claim 9** since they are related as the apparatus and a method of using the apparatus implemented using a computer-readable medium, and hence are rejected for the same reasons as given above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Kovacek whose telephone number is (571)270-3135. The examiner can normally be reached on M-F 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626

DMK, 04/09/2009